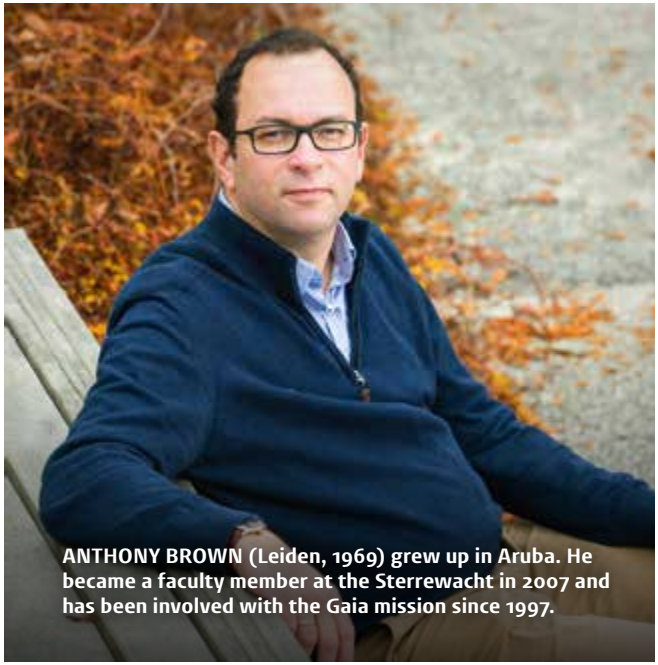
ANTHONY BROWN Leiden Observatory

Mapping our skies for future generations

Astronomer Anthony Brown wants to bring order to the terrifying complexity of our galaxy. As head of the Gaia Data Processing and Analysis Consortium, Brown is responsible for the largest three-dimensional map of our night skies ever created. It is a herculean task that will change our perception of space for decades to come.

By George van Hal



ANTHONY BROWN (Leiden, 1969) grew up in Aruba. He became a faculty member at the Sterrewacht in 2007 and has been involved with the Gaia mission since 1997.

The 3D map of our night skies offers us the clearest view of the stars in the history of mankind. The first Gaia data release, mapping over a billion stars in the Milky Way, is the largest-scale survey ever conducted of our cosmos. It includes data on over one billion objects, including the distances and motions for two million stars, paving the way for a true 3D map of our cosmological environment.

'It is probable that every astronomer will end up using our database', says Anthony Brown, 'although some might not know of it.' Brown oversees the operations and logistics of the massive mission that includes over 450 people from more than 160 institutes.

They collect data from the Gaia space telescope and translate it into a form that astronomers can use. They do not, however, do any scientific analysis themselves. 'We promised ESA we would release the data to the astronomical community before doing any work on it ourselves,' says Brown.

That, of course, is already a mind-boggling operation. Each of the billion objects – distant galaxies, stars in the Milky Way and asteroids in the solar system – is measured approximately 70 times. These data points are converted into properties such as position, velocity and brightness. The data even includes measures for the amount of dust obscuring an object.

'This will be the most important astronomical reference catalogue for years to come. It will provide our first opportunity to really understand the Milky Way and its structure,' says Brown. In fact, Gaia might even give new insight into one of the largest mysteries in astrophysics: the true nature of dark matter, the mysterious 'stuff' that infuses galaxies with extra gravity. Brown: 'Gaia will be the first means to map the distribution of dark matter in the Milky Way.'